

they were known to stop the street cars by killing the mules in their tracks.

Like the gnat, the mosquito, usually speaking, is not in the habit of wandering of its own accord far afield, and experiments conducted by the Public Health Service near Augusta, Ga. (20), on marked malaria carriers, found that the maximum natural flight from congested areas was one mile, and from less abundant communities not over a half mile, though occasionally the coast mosquitoes, including the New Jersey brand, are borne inland on the wind (21) 20 miles or more from their breeding marshes in a single night. On various barren keys off the coast of Florida mosquitoes have suddenly appeared when the wind is right to bear them from the breeding mainland. But with a change of direction the insects quickly vanish. The Carnegie Institution has made some studies bearing upon this phase of the question (22). A former WEATHER BUREAU observer, Dr. George Paterson, says that while at Sand Key he occasionally observed a swarm of mosquitoes humming about near the ground, brought in by a wind from the neighboring mangrove swamps and mainland breeding grounds. At such times it was necessary to take refuge in the top of the lighthouse, 110 feet from the ground, and thus beyond the altitude of flight of the pests, to escape them.

In the history of the malarial mosquito little is said about the actual spread of the disease through the agency of the wind, but Ealand narrates one notable example (23), stating that while malaria is not a city disease, conditions may thrust it upon a city, as in the case of Washington, D. C. To the south of Washington at one time lay a marshy area, the Potomac Flats, in which great numbers of the anopheles bred and flourished. With the prevailing summer-night breezes from the south the denizens of the marshes, whose voluntary flights would never have taken them so far, found themselves carried lightly along during their active hours to a rich feeding ground among human beings, where they could satisfy their appetites unchecked. Thus Washington became a city of malaria, and continued as such until the reclamation of the Flats.

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EFFECT OF A FLORIDA FREEZE ON INSECTS.¹

The disastrous Florida freeze of February 2-4, 1917, which killed or practically defoliated the citrus trees in Putnam, Volusia, and Marion Counties, and parts of Lake and Orange Counties, and heavily damaged trees in other sections of the State, was of considerable importance in "reducing the numbers of injurious pests which infested the trees." In the section where temperatures as low as 15° or 20° F. occurred the freeze or the falling and drying of the leaves nearly exterminated the rust mite and varieties of white fly and scale insects. Few adult specimens of the various species survived except on fired or otherwise protected groves or individual trees. Of the red scale it is believed that perhaps not more than 1 in 100,000 remained alive. The almost complete extermination of this species by the freeze and its reproduction to billions in six months is a most remarkable biological fact. In some instances there was no need of the usual early spraying yet, singularly enough, in most cases the normal number of insects appeared in the following summer or fall. So, as a rule, the setback in insect life, however great even over the area of maximum freeze, was only temporary.—W. E. H.

ANIMAL WEATHER PROPHETS.

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"Mere superstition," so the weather authorities say, are many of the long-distance weather predictions based on the conduct of animals. No one, so far as we know, has compiled a record of these so-called omens, but their number is multiple. They are based on a belief that animals are able to tell months in advance, for example, the character of the coming winter. If hunters bring a story to the effect that squirrels have made heavy stores of nuts, it is taken to mean that a severe winter impends. If early caught fur-bearing animals have a heavy, thick coat, that is another sign of a severe winter, or a thin coat, the contrary. If bird migrations are delayed after the usual date of the southward flight, a sign is seen of an open winter. Numerous other beliefs based on fancied ability of animals to foresee weather conditions months ahead, and base their preparations on them, have wide currency. Sometimes signs are taken from the vegetable world, as for example, the past fall in the Middle West. Corn husks, it was related, were much heavier than usual—that meant a hard winter.

The reasoning, such as it is, in many of these weather signs, is apparent on the surface. In the case of others it isn't, as with the most famous and well-known of them all—the groundhog sign. If Mister Woodchuck on Candlemas day—February 2—sees his shadow, issuing experimentally from his den, then "winter will have another flight." Otherwise an early spring impends.

Observation over a part of a single lifetime would demonstrate most of these weather signs as unreliable, yet they cling on, especially in country districts. It is possible that they do so, in part, because they shadow into animal signs of a different class which really are dependable. From the conduct of animals, accurate weather predictions can, within certain limits, be made.

This dependable class of animal weather signs is uniformly short distance as to prophecy—no longer than the daily newspaper weather forecast. They occur because

¹ "The Effects of the Freeze of Feb. 2-4, 1917, on the Insect Pests and Mites on Citrus," by W. W. Yothers, Bureau of Entomology, Orlando, Fla. From *The Florida Buglist*, vol. 1, No. 3, Dec. 21, 1917.